

REMARKS

Claims 1 - 26 are presented for further examination.

In the second Office Action mailed March 6, 2008, the Examiner withdrew the previous grounds of rejection and rejected all claims under 35 U.S.C. § 102(a) as anticipated by U.S. Patent No. 7,161,977 ("Jung").

Applicant respectfully disagrees and requests reconsideration and further examination of the claims.

Claim 1 is directed to a method of acquiring a received broadcast signal that includes, *inter alia*, mixing a received signal with a local frequency derived from a master clock signal, digitizing the received signal and correlating the same with a local version of the repeated code using a clock derived from the master clock source for a first time to produce a first result and correlating the received digitized signal with a local version of the repeated code using the clock derived coherently from the master clock source for a second time period to produce a second result, and combining the two correlation results by comparing the location of correlation peaks not appearing at the same position in both the first and second correlation results to acquire the broadcast signal.

In summary, the combination of claim 1 is directed to avoiding false correlations with signals from unwanted satellites that are caused by signals from the GPS satellites having substantially the same frequency but small differences due to Doppler shift, for example. This is achieved by performing two correlations of a received signal, the correlations being separated in time such that peaks from unwanted satellite signals are seen to drift in code phase between the correlations and can be discarded.

There are three key areas of difference between the method of claim 1 and the system of "Jung." Firstly, the system of Jung relies on ratios of peak heights to eliminate noise, whereas the claimed method uses relative positions of peaks to avoid cross correlations. Secondly, the two correlations are separated in time in the claimed method. Thirdly, in the current method the mixing and two correlations that are performed use clocks derived from the same master clock signal. In contrast Jung describes using different oscillators for down converting and mixing.

1) RELATIVE POSITIONS OF PEAKS ARE COMPARED

The Examiner rejects the claims in view of Jung. The first point to bear in mind is that, as specified in claim 1, the current method provides a way of distinguishing a signal from other codes, the purpose being to prevent cross correlations. Jung, on the other hand, is not separating a required signal from unwanted signals; it is separating required signals from random noise. Jung achieves this by performing a first tentative correlation to acquire the signal and a second correlation to verify that the tentative acquisition is correct. Code is discriminated from noise by comparing the ratio of the heights of the correlation peaks (see column 1, lines 62 to column 2 line 12). Jung functions by comparing peak height ratios, since these will change depending upon the integration period length if a peak is due to noise.

Jung simply does not disclose the claimed method in this respect, which uses a comparison of the location of correlation peaks to reject peaks not appearing at the same position in the first and second correlations. It is the comparison of the positions of the correlations that allows cross correlations to be rejected. Jung simply compares the height of correlation peaks to allow a correlation to be discriminated from noise. There is no mechanism in Jung to discriminate between correct correlations and cross correlations.

2) THE CORRELATIONS ARE SEPARATED IN TIME

The present claimed method requires that the first and second correlations are separated in time by a separation period. This is because a first portion of received GPS signal is used for a first correlation and a separate portion of GPS signal used for the second correlation, so that a signal from an unwanted satellite drifts between the two time periods, whereas the signal from the wanted satellite does not. It is clear that Jung does not teach this inventive concept because Jung specifically prefers to use the same portion of GPS signal by using a signal memory, as disclosed at column 5, lines 9 to 14. It is irrelevant in the system of Jung whether or not the first and second correlations are performed on the same portion of GPS signal or overlapping portions of GPS signal because Jung does not teach comparing the locations of correlation peaks. Clearly, in the preferred embodiment of Jung in which the same portion of GPS signal is used, there would be no shift in correlation peaks.

This demonstrates a clear difference in functionality between the current claimed method and Jung, since Jung does not rely upon two correlations separated in time. The time delay between correlations in the claimed method allows peaks from unwanted signals to wander in position so as to distinguish them. Since the system of Jung can function by performing the first and second correlations at the same time (*i.e.*, on the same portion of GPS signal), as described at column 5, lines 9 to 14, there is clearly a difference with the claimed method. This difference is due to the very different purposes of Jung and the current method, Jung being used to overcome the effects of random noise and the current method being used to distinguish between the codes of different satellites.

The portion of Jung that describes comparing code phases may be confusing to the reader. For example, Figure 4, at step 74 describes checking whether the largest peak obtained in the short correlation matches that in the long correlation (the correlations can be on received data that is not separated in time). The system simply finds the highest peak over a first integration period (calculated using ratios), finds the highest peak over a second integration period (again using ratios) and then as a final check ensures that these highest peaks are not due to noise by ensuring they share the same code phase. If they do not match code phases then the initial correlation is discarded and the process begins again.

This is very different to the claimed method, which looks at peaks in a correlation from received signals separated in time to identify the desired satellite.

Moreover, in the present method the desired satellite signal, which is coherently tracked as described above, will be putting all signal energy into the same frequency range/bin over the two separated correlations. This leads to reinforcement of the desired signal above the level of a single integration. Unwanted signals, which are not coherently tracked, will wander in frequency between the two correlations. This benefit is not present in the system of Jung because the two correlations need not be separated in time, and so there can be no shift in frequency between correlations.

3) MIXING AND CORRELATIONS ARE PERFORMED USING THE SAME CLOCK  
SOURCE

Lastly, to further demonstrate that Jung does not disclose the claimed method, it is noted that the claimed method uses a master clock source for the local mixing frequency and for the first and second correlations. This is because a coherent clock is required so that any shift in correlation peak location is due to relative movement of the satellites rather than to any local frequency shift. In contrast, the system disclosed in Jung envisages using different oscillators for down converting and code frequency, as disclosed at column 3, lines 13 to 24. The system in Jung may use different oscillators because, as explained above, the system does not use the change in location of correlation peaks caused by frequency shifts as a mechanism to discriminate cross correlations, as in the present claimed method.

In view of the foregoing, applicant respectfully submits that claim 1 is allowable over Jung. Dependent claims 2-11 are allowable for the features recited therein as well as for the reasons why claim 1 is allowable.

Claim 12 is directed to a system, claim 20 is directed to a receiver, and claim 24 is directed to a method, all of which include at least one or more of the distinguishing features discussed above. Applicant respectfully submits that these claims and all claims depending there from are allowable over Jung inasmuch as Jung does not teach or suggest any of the claimed combinations.

In view of the foregoing, applicant respectfully submits that all of the claims in this application are clearly in condition for allowance. In the event the Examiner disagrees or finds minor informalities that can be resolved by telephone conference, the Examiner is urged to contact the below-listed counsel of record in order to expeditiously resolve prosecution of this application. Consequently, early and favorable action allowing these claims and passing this case to issuance is respectfully solicited.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,  
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